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EVALUATION OF CAULIFLOWER CULTIVARS FOR PROCESSING - 1980

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The primary objectives in our evaluation of cauliflower cultivars for processing are; 1-to evaluate field seeding of lines and adaptation to Ohio for late fall harvest, 2-to determine if lines are available which would provide high quality curds without tying, 3-to evaluate lines for high quality product after brining and 4-to examine compounds for brining which may be substituted for the 100° Salometer salt brine.

Sources of seed are in Table 1. There were 6 cultivars which had sufficient seed for field seeding in a replicated trial and the remaining 14 cultivars and lines were placed in a non-replicated observational trial. Seeding was done with a Planet-Jr. on June 19, 1980. Rows were 30 ft long and were thinned to 18 inches after emergence. The field received a preplant broadcast application of 700 lbs/A of 10-20-20 plus 1 lb. of B. Two additional side-dressings of 40 lbs/A of N as ammonium nitrate were made during early plant development. Trifluralin was used as the herbicide at recommended rates and diazinon was used for early maggot control. Other cultural practices were according to standard practice.

The growing season was relatively dry and the plots were irrigated when necessary for maintaining continuous growth. However, stress did occur and this undoubtedly affected growth, maturity and quality of the curds.

There was considerable variability in emergence between and within cultivars. Thinning the plants helped reduce the non-uniformity but the uniformity was still generally less than desirable in a commercial planting. None of the cultivars produced plants with sufficient leaf cover to eliminate tying for high processed quality cauliflower and the non-uniformity complicated tying as well as harvesting.

Field observations and harvest data are presented in Table 2. Imperial 10-6 was used as a standard because it is used for processing and has reasonably good quality. Total yields are not given because of generally poor uniformity and a prime reason for growing the several cultivars was for studying brine quality. Nevertheless, most of the cultivars in the replicated trial did reasonably well except possibly for Snowball Y (leaves in curd) and Snowball 16 which had inadequate leaf cover.

There was one outstanding cultivar in the non-replicated trial, based upon field evaluation, Snow Diana, and it also brined reasonably well (Table 3).

It was our opinion that the color and texture ratings for good brine quality should be near 4 or higher. Based upon these criteria, many of the cultivars and lines do not measure up and thus are not included in the 1981 trial.

The effort to improve color and texture by using organic acids with and without salt brine was generally a failure (Table 4). Efforts will be renewed in 1981.

TABLE 1. Cauliflower seed sources.

Cultivar or Line	Source
Self Blanche	Harris Seed Company
Imperial 10-6	Harris Seed Company
Snowball Y	Harris Seed Company
Snowball 93	Northrup-King Company
Snowball D	Northrup-King Company
Snowball 16	Northrup-King Company
White Empress	Northrup-King Company
Snow King	Takii Company
Snow Diana	Takii Company
Snow Crown	Takii Company
Stovepipe	Stokes Seed Company
Alert	Stokes Seed Company
Raket	Stokes Seed Company
White Top	Stokes Seed Company
77-876	S. Honma, Michigan State University
77-879	S. Honma, Michigan State University
78-802	S. Honma, Michigan State University
78-832	S. Honma, Michigan State University
78-882	S. Honma, Michigan State University
78-908	S. Honma, Michigan State University

TABLE 2. Harvest and plant quality ratings of cauliflower cultivars and lines. 1980, Vegetable Crops Branch.

	Harvest Data				Field Ratings**					
Cultivar	Head wt. (lbs)	Curd* rating	No. of harvests	Range of harvest dates	Plant size	Uniformity	Suckers	Leaf cover	Leaves in curd	Curd color
Replicated Lines										
Self Blanche	2.30	5.00	2	10/31-11/13	4.0	3.5	5.0	4.0	4.0	5.0
Imperial 10-6	2.52	4.00	2	10/27-11/13	3.8	3.0	5.0	4.0	4.0	5.0
Snowball Y	3.77	3.47	3	10/2-11/5	4.5	3.0	5.0	4.0	2.5	4.0
Snowball 93	4.13	3.92	2	10/2-11/5	4.5	3.0	5.0	4.5	4.0	5.0
Snowball D	2.84	4.50	2	10/27-11/13	3.5	2.0	5.0	4.5	5.0	5.0
Snowball 16	3.73	3.52	3	10/2-11/5	4.5	3.5	5.0	2.5	3.0	3.5
Non-replicated Lines										
Snow Crown	2.76	4.15	1	9/8	3.5	2.0	---	2.5	4.5	4.5
Snow King	3.46	1.75	1	9/8	3.5	3.5	---	2.5	3.0	3.0
Snow Diana	4.60	5.00	1	10/27	4.5	4.5	5.0	4.5	5.0	5.0
White Empress	2.40	4.39	2	9/22-10/2	3.5	3.5	---	---	3.0	2.5
Stove Pipe	1.46	2.28	2	9/12-10/2	4.0	2.0	3.0	2.5	3.5	3.5
Alert	2.46	3.33		9/22-11/5	3.0	2.0	3.0	3.0	2.0	2.0
Raket	Not Harvested - Poor leaf color, poor uniformity, not adapted to Ohio fall crop									
White Top	4.50	5.00	1	10/27	---	2.0	---	4.0	4.0	4.5
77-876	1.76	2.50	1	9/12	2.5	2.0	2.0	3.0	---	3.0
78-802	1.62	2.33	1	9/12	4.0	2.5	1.0	2.5	2.5	2.0
78-832	2.10	2.63	2	9/12-10/2	3.0	2.0	3.0	3.0	4.0	3.0
77-879	2.37	1.85	1	9/12	2.5	2.0	1.0	2.5	3.5	2.5
78-882	1.85	1.67	1	9/12	2.5	3.0	2.0	2.5	3.5	3.0
78-908	2.45	3.78	2	9/12-10/2	4.0	4.0	3.5	4.0	4.0	4.0

* Curd Rating 1-5; 1 = uneven, leafy, rough head; 5 = smooth, uniform, white, excellent head

** Field Ratings 1-5:
Plant Size 1 = Small plant; 5 = large plant
Uniformity 1 = very poor uniformity in plant sizes; 5 = very uniform plant size
Suckers 1 = many suckers; 5 = no suckers
Leaf Cover 1 = very exposed head; 5 = excellent leaf cover to protect curd
Curd color 1 = yellow to purple to grey; 5 = white

TABLE 3. Quality ratings of cauliflower cultivars and lines after brining in 100° Salometer for 8-12 weeks. 1980, Vegetable Crops Branch.

Cultivar	Color*	Texture*
Self Blanche	4.0	4.0
Imperial 10-6	3.8	4.5
Snowball Y	3.8	4.0
Snowball 93	3.7	4.3
Snowball D	3.0	4.5
Snowball 16	3.5	3.7
Snow Crown	---	---
Snow King	2.5	5.0
Snow Diana	4.0	3.5
White Empress	2.5	4.0
Stove Pipe	2.0	3.5
Alert	2.5	4.0
Raket	---	---
White Top	4.5	4.0
77-876	1.0	4.0
78-802	1.5	4.0
78-832	2.0	4.0
77-879	3.5	4.5
78-882	1.0	4.0
78-908	2.5	4.0

* Ratings on a scale of 1-5
Color: 1= brown or gray
5 = curd is white - no samples were white, some were light pink
Texture: 1 = soft and mushy
5 = firm and crisp

TABLE 4. Influence of several treatments on cauliflower curd color and texture after brining for 8 weeks, cv. Imperial 10-6, 1980, Vegetable Crops Branch.

Treatment	Quality Ratings* Color	Texture	Remarks
Citric acid - 4% by wt.	4.5	1.0	Mold on top of brine
Lactic acid - 4% by wt.	2.0	2.0	Mold on top of brine
Acetic acid - 4% by wt.	3.0	3.0	Edge & cut surface of curd is brown
Lactic acid + Acetic acid 4:1 ratio, 4% by wt.	3.0	2.0	Edge & cut surface of curd is brown
Citric acid - 4% + 100° Salometer salt	2.0	2.5	Curd is brown throughout
Lactic Acid - 4% + 100° Salometer salt	2.0	2.5	Dark pink in curd
Acetic acid - 4% + 100° Salometer salt	2.5	4.5	Curd is grey
Lactic-Acetic acids 4:1-4% + 100° Saolometer salt	2.5	2.0	Curd is grey
Ascorbic Acid - 50 ppm + 100° Salometer salt	2.5	5.0	Curd is grey
Ascorbic Acid - 100 ppm + 100° Salometer salt	2.5	5.0	Curd is grey
Ascorbic acid - 200 ppm + 100° Salometer salt	2.5	5.0	Curd is grey
Ascorbic acid - 500 ppm + 100° Salometer salt	2.5	5.0	Curd is grey
100° Salometer salt	3.8	4.5	Curd is light pink

* Rated 1-5:
Color: 1 = brown or grey
5 = white
Texture: 1 = soft and mushy
5 = firm and crisp

NOTE: Ascorbic acid only treatments putrified and were discarded.

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